

Patent claims

1. A metallic protective layer,  
consisting of (in percent by weight wt%)  
5 11.5 to 20.0% chromium,  
0.3 to 1.5% silicon,  
0.0 to 1.0% aluminum,  
0.0 to 0.7 wt% yttrium and/or at least one metal selected  
from the group consisting of scandium and the rare earth  
10 elements,  
remainder iron and production-related impurities.
2. The metallic protective layer as claimed in claim 1,  
consisting of (in percent by weight wt%)  
15 12.5 to 14.0% chromium,  
0.5 to 1.0% silicon,  
0.1 to 0.5% aluminum,  
remainder iron and production-related impurities.
- 20 3. A layer system,  
at least comprising a substrate (4)  
and a metallic protective layer (7) as claimed in claim 1  
or 2 on the substrate (4).
- 25 4. The layer system as claimed in claim 3,  
characterized in that  
the substrate (4) is metallic or ceramic.

5. The layer system as claimed in claim 3 or 4,  
characterized in that  
the substrate (4) is a ferritic base alloy, a steel or a  
nickel-base or cobalt-base superalloy.
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6. The layer system as claimed in claims 3 to 5,  
characterized in that  
the metallic protective layer (7) is ferritic.
- 10 7. The layer system as claimed in claim 3, 5 or 6,  
characterized in that  
the metallic protective layer (7) and the substrate (4)  
are ferritic.
- 15 8. The layer system as claimed in claim 3 or 7,  
characterized in that  
the protective layer (7) bonds to the substrate (4) by  
adhesion.
- 20 9. The layer system as claimed in claim 3, 7 or 8,  
characterized in that  
the layer system (1) has not undergone any diffusion  
treatment.

10. The layer system as claimed in claim 7, 8 or 9,  
characterized in that  
the coefficients of thermal expansion  $\alpha$  of the protective  
layer (7),  
5 in particular of the ferritic protective layer (7),  
and of the substrate (4),  
in particular of the ferritic substrate (4),  
are equal, virtually equal or have a difference of up to  
10% in the expansion coefficients  $\alpha$ .
- 10 11. The layer system as claimed in claims 3 to 10,  
characterized in that  
the substrate (4) is an iron-base alloy,  
in particular a 1% CrMoV steel or a 10 to 12% chromium  
15 steel.
12. The layer system as claimed in claims 3 to 10,  
characterized in that  
the substrate (4) is  
20 a 1% to 2% Cr steel,  
in particular 30CrMoNiV5-11 or 23CrMoNiWV8-8 or G17CrMoV5-  
10 or G17CrMo9-10, or  
a 10% Cr steel,  
in particular X12CrMoWVNbN10-1-1 or GX12CrMoWVNbN10-1-1 or  
25 GX12CrMoVNB9-1.

13. The layer system as claimed in claim 3,  
characterized in that  
a ceramic layer (10) is present on the metallic protective  
layer (7).

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14. The layer system as claimed in claim 13,  
characterized in that  
the ceramic layer (10) is a thermal barrier coating,  
in particular based on zirconium oxide.

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15. The layer system as claimed in claim 3 or 14,  
characterized in that  
the layer system (1) is a layer system (1) of a component  
(110, 120, 130) of a gas turbine (100) or is a component  
(333, 354, 357, 366) of a steam turbine (300, 303).

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16. The layer system as claimed in claim 3 or 15,  
characterized  
in that the layer system (1) is a turbine blade or vane  
(120, 130, 354, 357, 366) or  
in that the layer system (1) is a housing part or a region  
of a housing of a turbine (100, 300, 303), or  
in that the layer system (1) is a lining (155) of a  
combustion chamber (110).

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17. The layer system as claimed in claim 3, 15 to 19,  
characterized in that  
the layer system (1) is arranged on a newly produced  
component, in particular for a turbine blade or vane (120,  
130, 354, 357, 366).

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18. The layer system as claimed in claim 3, 15 to 19,  
characterized in that  
the layer system (1) is present on a refurbished  
component, in particular for a turbine blade or vane (120,  
130, 354, 357, 366).

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